CLAIMS

1. An electromagnetic generator comprising two magnets and a coil disposed therebetween, the two magnets being configured to define therebetween a region of magnetic flux in which the coil is disposed whereby relative movement between the coil and the magnets generates an electrical current in the coil, and a vibratable first mount for each of the magnets and a vibratable second mount for the coil whereby each of the at least two magnets and the coil are respectively vibratable about a respective central position.

2. An electromagnetic generator according to claim 1 wherein the vibratable first mount and the vibratable second mount are adapted to vibrate out of phase when excited to vibrate by a common input of vibration energy, so that the coil and its respective magnets vibrate out of phase with each other.

3. An electromagnetic generator according to claim 2 wherein the vibratable first mount and the vibratable second mount are adapted to vibrate substantially in anti-phase when excited to vibrate by a common input of vibration energy, so that the coil and its respective magnets vibrate substantially in anti-phase with each other.

4. An electromagnetic generator according to any one of claims 1 to 3 wherein each of the vibratable first mount and the vibratable second mount comprises a cantilever beam.

5. An electromagnetic generator according to claim 4 wherein the cantilever beam of each vibratable first mount has substantially one half of the mass of the cantilever beam of the vibratable second mount.

6. An electromagnetic generator according to claim 5 wherein the cantilever beam of each vibratable first mount is substantially the same length as the cantilever beam of the vibratable second mount.

7. An electromagnetic generator according to any one of claims 4 to 6 wherein each magnet is mounted at a free end of the cantilever beam of each vibratable first mount and the coil is mounted at a free end of the cantilever beam of the vibratable second mount.

8. An electromagnetic generator according to any foregoing claim wherein each of the vibratable first mount and the vibratable second mount are mounted on a common base.

9. An electromagnetic generator according to claim 8 wherein each of the vibratable first mount and the vibratable second mount are integral with the common base.

10. An electromagnetic generator according to any foregoing claim wherein the at least two magnets and the coil are mounted along a common axis.

11. An electromagnetic generator according to any one of claims 1 to 9 wherein the at least two magnets and coil are mounted along a common line defining a polygon or a portion thereof.

12. An electromagnetic generator according to claim 11 wherein the polygon is a circle.

13. An electromagnetic generator according to any foregoing claim, comprising a plurality of the coils and more than two of the magnets, each coil being disposed between a respective pair of the magnets.

14. An electromagnetic generator according to claim 13 wherein at least one of the magnets is disposed between a pair of the coils and thereby comprises a common magnet for adjacent coils.

15. An electromagnetic generator according to claim 13 wherein each coil is associated with and disposed between a respective pair of the magnets so that each coil and its associated magnets comprise an independent resonating structure having a resonating

mode that is substantially decoupled from other resonating structures comprised of other coil and magnet combinations.

16. An electromagnetic generator according to any one of claims 13 to 15 wherein the plurality of the coils have at least two resonant frequencies when vibrated on their respective second vibratable mount.

17. An electromagnetic generator comprising first and second coils each disposed between a respective pair of magnets which are configured to define therebetween a region of magnetic flux in which the respective coil is disposed whereby relative movement between the respective coil and the respective magnets generates an electrical current in the respective coil, and wherein the first and second coils each have different respective resonant frequencies when vibrated relative to their respective magnets.

18. An electromagnetic generator according to claim 17 wherein at least one of the magnets is disposed between the first and second coils, which are adjacent, and thereby comprises a common magnet for the first and second adjacent coils.

19. An electromagnetic generator according to claim 17 wherein each of the first and second coils is associated with and disposed between a respective pair of the magnets so that each coil and its associated magnets comprise an independent resonating structure having a resonating mode that is substantially decoupled from the other resonating structure comprised of the other coil and magnet combination.

20. An electromagnetic generator according to any one of claims 17 to 19 further comprising a vibratable first mount for each of the magnets and a vibratable second mount for each of the first and secnd coils whereby each of the at least two magnets and the respective first or second coil are respectively vibratable about a respective central position.

21. An electromagnetic generator according to claim 20 wherein the vibratable first mount and the vibratable second mount are adapted to vibrate out of phase when excited to

vibrate by a common input of vibration energy, so that the coil and its respective magnets vibrate out of phase with each other.

22. An electromagnetic generator according to claim 21 wherein the vibratable first mount and the vibratable second mount are adapted to vibrate substantially in anti-phase when excited to vibrate by a common input of vibration energy, so that the coil and its respective magnets vibrate substantially in anti-phase with each other.

23. An electromagnetic generator according to any one of claims 19 to 22 wherein each of the vibratable first mount and the vibratable second mount comprises a cantilever beam.

24. An electromagnetic generator according to claim 23 wherein the cantilever beam of each vibratable first mount for a pair of the magnets has substantially one half of the mass of the cantilever beam of the vibratable second mount for the associated coil.

25. An electromagnetic generator according to claim 24 wherein the cantilever beam of each vibratable first mount is substantially the same length as the cantilever beam of the vibratable second mount.

26. An electromagnetic generator according to any one of claims 23 to 25 wherein each magnet is mounted at a free end of the cantilever beam of each vibratable first mount and each coil is mounted at a free end of the cantilever beam of a respective vibratable second mount.

27. An electromagnetic generator according to any one of claims 19 to 26 wherein each of the vibratable first mount and the vibratable second mount are mounted on a common base.

28. An electromagnetic generator according to claim 27 wherein each of the vibratable first mount and the vibratable second mount are integral with the common base.

29. An electromagnetic generator according to any one of claims 19 to 28 wherein the magnets and the first and second coils are mounted along a common axis.

30. An electromagnetic generator according to any one of claims 19 to 29 wherein the magnets and the first and second coils are mounted along a common line defining a polygon or a portion thereof.

31. An electromagnetic generator according to claim 30 wherein the polygon is a circle.

32. A health and usage monitoring system (HUMS) for an aircraft, the system incorporating at least one electromagnetic generator according to claim 1 or claim 17.

33. A health and usage monitoring system (HUMS) for an aircraft according to claim 32, the system including a sensor and a local wire less transmission system, both the sensor and the wire less transmission system being powered by the electromagnetic generator.

34. A sensing system for railway lines and associated components, the system incorporating at least one electromagnetic generator according to claim 1 or claim 17.

35. A sensing system for railway lines and associated components according to claim 34, wherein the electromagnetic generator is adapted to generate power from the vibration provided by the passage of a train, either directly from the rail line or via a cantilever attached to the rail line.

36. A sensing system for railway lines and associated components according to claim 35, wherein the sensing system includes a sensor and means to telemeter the output data to a remote location.

37. A vehicle battery charger system incorporating at least one electromagnetic generator according to claim 1 or claim 17.

38. A vehicle battery charger system according to claim 37 incorporated into a battery recharging system for a tracking system for a lorry or truck trailer.

39. A mobile telecommunications equipment incorporating at least one electromagnetic generator according to claim 1 or claim 17.

40. A conditioning monitoring system incorporating at least one electromagnetic generator according to claim 1 or claim 17.

41. An electromagnetic generator substantially as hereinbefore described with reference to the accompanying drawings.